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Claim 1 (currently amended). A thermally-integrated water-gas shift reactor for converting reformate gases including carbon monoxide in the presence of steam to form carbon dioxide and water comprising, in combination,

a) a waste-heat recovery steam generator for the recovery of exothermic reaction heat to generate steam,

b) an outer region extending at least part way about said waste-heat recovery steam generator,

c) a catalyst bed located within said outer region, and through which reformate gases flow, said bed extending only helically, there being flow guide surfaces extending helically adjacent the catalyst to direct all gases to flow only helically through the helical bed,

d) the outer region being in heat transfer communication with the steam generator to maintain the catalyst bed within a predetermined temperature range for operation of a water-gas shift reaction producing said exothermic reactor heat.

Claim 2 (previously presented). The combination of claim 1 wherein the waste heat steam generator operates at temperatures in one of the following ranges: 360°F to 450°F, and of 385°F to 400°F, that is optimum for conducting the water-gas shift reaction.

Claim 3 (currently amended). The combination of claim 1 wherein said bed includes a Cu/Zn catalyst which is contained in space defined by said outer region, and there being an inner wall adjacent said space and that is in thermal contact with a boiling water fluid in said generator.

Claim 4 (previously presented). The combination of claim 3 wherein the boiling water fluid is located proximate the bed to heat the bed during start-up.

Claim 5 (previously presented). The combination of claim 3 wherein the catalyst bed extends helically about said waste heat recovery steam generator to transfer heat to the boiling water fluid.

Claim 6 (previously presented). The combination of claim 1 including heat transfer fins projecting in said bed to enhance the rate of heat transfer to and from the catalyst bed.

Claim 7 (currently amended). The combination of claim 1 including inner and outer walls for defining annular space, containing said helical bed, and a helical coil at said space to conduct and increase the velocity of the gases as they flow helically through the catalyst helical bed and to enhance the rate of heat transfer to and from the catalyst bed[[.]], said space being between 1 and 2 inches wide to minimize temperature differentials between the outer and inner walls, and wherein the gases have hourly space velocity in the range of 500hr-1 to 2000hr-1.

Claim 8 (previously presented). The combination of claim 1 wherein the catalyst bed is sufficiently close to said generator to be maintained in one of the following ranges: between 370°F and 550°F, and between 400°F and 450°F.

Claim 9 (previously presented). The combination of claim 3 including outside and inside walls defined by said space, and wherein the space is between 1 and 2 inches wide to minimize temperature differentials between the outside and inside walls.

Claim 10 (previously presented). The combination of claim 3 wherein the bed has helical length characterized in that the gases have hourly space velocity in the range of 500hr-1 to 2000hr-1.

Claim 11 (previously presented). The combination of claim 1 wherein the waste heat stem generator contains one or more heat transfer conduits that transfer heat from combustion products to a boiling water fluid for the purpose of generating steam.

Claim 12 (previously presented). The combination of claim 1 wherein the steam generator includes an upright vessel, said outer region having an upper level inlet flowing reformate gases into the catalyst bed, the reformate gases including carbon monoxide, and said region having a lower level outlet, a heat transfer conduit or conduits extending within said vessel and immersed within boiling water contained in said vessel

inwardly of said catalyst bed, said conduit or conduits operable for transfer of heat to the boiling water, for generating steam exiting from said vessel.

Claim 13 (original). The combination of claim 1 wherein the catalyst bed extends helically about said generator.

Claim 14 (original). The combination of claim 1 including a helical coil in said outer region and extending about said generator, to direct said reformate gases helically and through said catalyst bed, to enhance heat transfer via said bed.

Claim 15 (currently amended). In combination:

a) a steam generator,

b) and means including catalyst ~~extending~~ all of which extends only in a substantially helical path about the steam generator, and in heat transfer relation with the generator,

c) said catalyst adapted to receive gases all of which flow along said path and react in the presence of the catalyst to produce exothermic heat that is transferred laterally of said path to the generator.